

## Some Thoughts on Amateur Radio Digital History

**M**y "historical" stack of amateur packet radio papers is about fifteen inches high these days. I've been collecting advertisements, articles, etc., relating to amateur radio digital communications dating back to the beginning of packet radio. I have fantasies of scanning each page and linking all the image files via a simple Hypertext Markup Language (HTML) document, and then storing them all on a big hard disk, later possibly a CD for easy reference. However, there are insufficient "Amateur Time Units" for such things these days, and the stack waits patiently.

I had to move the "archives" recently and actually again looked at some of the things I have in the pile. In this month's column I'll offer some remembrances to go with this issue's historical theme.

### Digital History

Early amateur radio was, of course, purely digital (CW). There have been some interesting experiments conducted with high-speed, computer-generated CW, and the data rates that can be achieved using digital signal processing to receive are surprising.

Radio Teletype (RTTY) in amateur radio remains popular to this day, although it has been supplanted to a great degree by a number of new HF digital communications systems, such as PSK-31.

Most older amateurs forget, and most newer amateurs never knew, that the modern era of amateur radio digital communications did not begin with the introduction of the TAPR TNC-1. Experiments in Canada predate the formation of TAPR by several years. Quoting liberally from one of the many X-NEDA pages (<[www.cam.org/~burt/neda/pranni.html](http://www.cam.org/~burt/neda/pranni.html)>) maintained by Burt Lang, VE2BMQ:

At around 9 pm on May 31, 1978 the first known transmissions of packet over amateur radio were sent. The place was the upstairs banquet hall of Bill Wong's Restaurant on Decarie Blvd. in Montreal, Quebec, Canada. The event was a special meeting of the Montreal Amateur Radio Club (MARC) called to discuss and debate proposed changes to the Canadian amateur frequency allocations that were being contemplated at the time by the Canadian Government Dept. of Communications (DOC). In attendance were several DOC officials from Ottawa, including the Director General - Regulations, Dr. John deMercado. Dr. deMercado is considered by some to be the "father" of amateur packet radio due to his persistent pressure to open up an exclusive portion of amateur band to experiment with the new mode and due to his early experience on the Aloha project in Hawaii. Others take a less charitable view of his role in the matter.

The first packet message was reported to have been "From John deMercado to the Montreal group—Bravo, well done!" or something like that. As is common with many historical events, the participants did not bother to record the particulars and memory now is less than perfect.

The Montreal Packet Net group consisted of: Bob Rouleau,

VE2PY; Norm Pearl, VE2BQS; Fred Basserman, VE2BQF; Bram Frank, VE2BFH; Jacques Orsali, VE2EPH; Ted Baleshta, VE3CAF; Ian Hodgson, VE2BEN; and others not mentioned.

A detailed description of the Montreal Protocol and hardware used in the experiments is given in the TAB book #1345 *PACKET RADIO* by Bob Rouleau and Ian Hodgson published in 1981. An interesting note is that the Montreal Modem design used the Exar XR-2206/2211 chip set. I am told that a sample of the Montreal Modem was sent to the Vancouver group (VADCG) in the fall of 1978 and it is probably no coincidence that the same chip set appeared in the TAPR TNC modem of which Doug Lockhart of VADCG had a hand in designing.

It is ironic that none of the members of the original Montreal Packet Net group are presently in amateur packet radio. After an initial spurt of activity in amateur packet, Bob Rouleau and several others in the group turned to commercial applications for packet radio. The resulting company, DataRadio Inc., today is building and marketing commercial packet radio systems around the world. A typical application is the Canadian Weather Radio packet service introduced some years ago using DataRadio equipment specially designed for the application.

We should congratulate these early pioneers in amateur packet radio for the work they did in getting the hobby started. It is through their early efforts that today's worldwide packet system has grown, often chaotic, seldom planned but with a continuous forward progress due to the efforts of countless others in the intervening years to advance and refine the technology. In the words of the first packet message: *Bravo, Well Done!!*

The commercial counterparts of amateur packet radio experimentation are too numerous to mention. PacComm and Kantronics (and to a lesser extent AEA and MFJ) come immediately to mind as having achieved notable success in commercial packet radio communications. CLOVER, one of the first of the modern HF data communications systems, was pioneered in amateur radio by the late Ray Petit, W7GDM. Refined by HAL Communications, CLOVER later went on to be used extensively in marine HF data communications which enabled boaters to send and receive e-mail using their marine HF radios.

Phil Karn, KA9Q (and Dewayne Hendricks, WA8DZP, for the Macintosh version), deserves special mention for the advocacy of TCP/IP in amateur radio. When Phil's proposals weren't taken seriously (enough), he took the unusual step of developing NET, a fully standards-compliant TCP/IP stack that ran on a DOS PC. Phil set the tone of amateur radio software development when he released NET complete with the source code. He brooked few complaints about NET's features and shortcomings, pointing the complainer to FTP sites where the source code could be downloaded.

The closest equivalent to NET was a less-capable, poorly documented commercial TCP/IP stack that cost hundreds of dollars. NET sparked a new generation of amateur radio networkers who learned about TCP/IP networking many years before TCP/IP gained wide recognition as the "protocol that runs the internet."



In 1987 I was in the crowd when Dale Heatherington, WA4DSY, first demonstrated his 56 Kbps modem at the Dayton Hamvention®. It was amazing how quickly it could move data, and it was a true next-generation system. Only a few networks were built using the 56K technology.

APRS has revolutionized packet radio by returning to simpler, easier to understand and maintain digipeater networks. It's truly unfortunate that much of the "institutional knowledge" of digital networking seems to be completely lost. There are good reasons not to concentrate all packet radio activity on a single channel, as many popular regional APRS networks are discovering, and many networking solutions were developed over the years that would seem to be applicable to the problem of congestion (and congestive collapse) on APRS networks.

There has been no shortage of networking systems either, including:

- Packet Bulletin Board System message forwarding

- Net/ROM
- TexNet
- ROSE
- Flexnet

I continue to be impressed with just how much direct and indirect crossover there is between amateur radio and commercial technology. The deeper you delve into all that amateur radio digital communications has to offer, the more you find yourself prepared for commercial wireless systems. I continue to recommend getting involved in amateur radio as a way for technically minded youth to become self-trained for careers in wireless and other technical careers.

If you're interested in reading more about packet radio's rich history, a lot of good information is contained in the various *Proceedings* of the ARRL, and later ARRL and TAPR Digital Communications Conferences. Most years' *Proceedings* are still available from TAPR.

As always, comments and questions on these and other topics are welcome and greatly appreciated.

73, Steve, N8GNJ

#### Correction

The internet address for the Puget Sound Amateur Radio TCP/IP Group (WETNet) mentioned in my October 2001 column is now <www.seatcp.net>.

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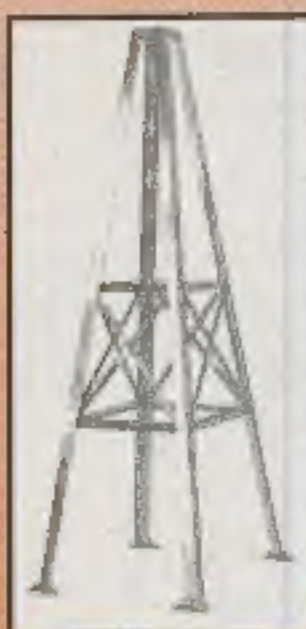
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